Monitor Alternative Intra- and Inter-City Transit Service Options

Activity Purpose and Overview

Part of the multi-modal vision is to look forward to long-range ideas and opportunities for modal options that may not be immediately available to the community. By continuing discussion, research, and planning for alternative travel options over a period of decades, opportunities will present themselves. As time passes, technologies will emerge that may enable transit options not feasible today to become legitimate opportunities. Also, over time, multi-modal oriented design standards, once developed and implemented, will adjust the nature of land uses and over time will enable more robust transit options to be implemented. Finally, as the community grows, additional needs will be identified and additional transit options may become more feasible.

There are four alternative transit service options addressed in this report as possible future opportunities to further multi-modal options in Lincoln and Lancaster County:

- Bus Rapid Transit
- Light Rail Transit
- Inter-City Bus and Rail Transit
- Personal Rapid Transit

Each of these transit options should be viewed as potential long-range future opportunities to expand multi-modalism in our community. Advances in technologies related to each of these options should be monitored, and consideration should be given to appropriate applications of these transit possibilities as opportunities present themselves and as funding becomes available over the long term.

Activity Purpose and Overview

This section will briefly review information on four long range transit options. The basic information provided will identify what the transit concept entails as well as what issues present themselves when implementation is considered.

Bus Rapid Transit

"Bus Rapid Transit (BRT) is a flexible, rubber-tired rapid transit mode that combines stations, vehicles, service, running-ways, and Intelligent Transportation System (ITS) elements into an integrated system of facilities, equipment, services, and amenities that collectively provide high quality, high performance rapid transit." (Transportation Research Board, 2003) In many ways, BRT is very similar to Light Rail Transit (LRT) - which will be discussed in the next section - but it has greater flexibility in its operations (it is not physically constrained as far as route structure is concerned), and it potentially has lower capital and operating costs.

The primary features of Bus Rapid Transit are:

- Dedicated running ways
- Accessible, safe, secure, attractive stations
- Easy to board, attractive, environmentally friendly vehicles
- Efficient fare collection (pre-paid fares)
- Intelligent Transportation System (ITS) applications to provide real-time passenger information, signal priority, and service command/control
- Frequent, all day service

The most common and most identifiable feature is exclusive and dedicated running ways (bus lanes). They are the key element and must support reliably rapid movement of buses with minimum interference from general traffic. They must also provide a clear presence and permanence. Parking control and turn control are needed along bus running ways, and traffic signal cycles should be as short as possible to make the routes more efficient. Dedicated bus lanes are most important at intersections and in high traffic areas along bus routes.

BRT is especially desirable in large cities where passenger flows warrant frequent service, where there is a sufficient presence of buses along a corridor to justify dedicated running ways, and where central business districts contain significant amounts of employment.

Development costs for BRT systems vary according to what type of system is being implemented. The median implementation costs per mile are $7.5 million for dedicated surface busways; $6.6 million for arterial median busways; and $1 million for mixed traffic or curb bus lanes.

Light Rail Transit

Light Rail Transit (LRT) is "a metropolitan electric railway system characterized by its ability to operate single cars or short trains along exclusive rights-of-way at ground level, on arterial structures, in subways, or, occasionally, in streets, and to board and discharge passengers at track or car floor level." (Transportation Research Board) Unlike Bus Rapid Transit, Light Rail Transit uses fixed rails and uses a power source such as overhead electrical lines. Some LRT systems do use diesel fuel as a power source.

In most current settings, maximum speeds of light rail trains is normally 60 miles per hour, while heavy rail trains normally operate at higher speeds. Depending upon the specific system, the distance between light rail stations is shorter than within heavy rail systems, which lends some major advantages to urban settings. Within a light rail system, trains may operate in mixed street traffic (urban areas), downtown malls, on dedicated rights of way, or in the middle of major thoroughfares, where trains cross intersections in the same manner as other vehicles. Due to these factors, the "average" speed of light rail systems is significantly lower than heavy rail systems.

Light rail "trains" operate as either single or multiple car consists (trains). Passenger capacity of each car in a multiple car consist can be up to as many as 250 passengers (standees included). The number of cars that can be operated in any one consist are limited by several factors. One of the major factors is station platform length. Other factors include traffic logistics within the city and the ability of the control cab to operate more than a certain numbers of cars.

Compared to heavy rail, light rail can be very practical for urban applications due to it's ability to operate in mixed traffic settings. This ability can severely reduce construction costs of an urban rail system. However, within the same system, light rail has the ability of traveling at speeds of up to 60 miles/hr when separated from these mixed traffic settings.

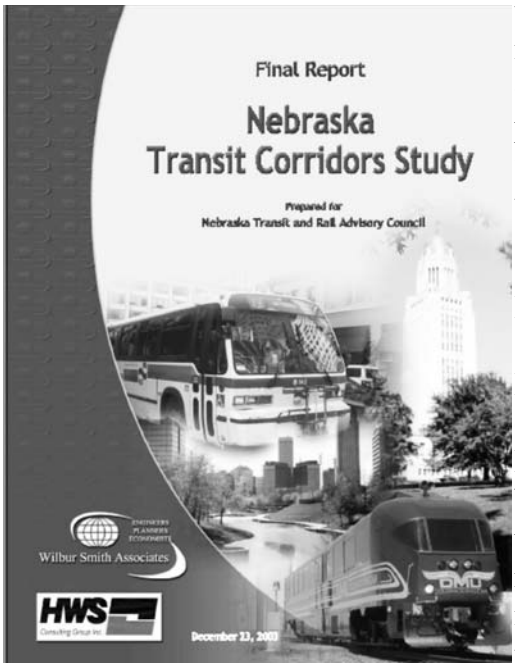
One of the major advantages of light rail over bus rapid transit is the permanence of the system. This can provide advantages to community development plans and long term transit planning efforts along the LRT system. Related to this advantage is an inherent disadvantage in that LRT systems are more expensive (approximately $45 million per mile for a surface level LRT system based on 2002 Federal Transit Administration New Starts information). They are also less able to be adjusted and "moved" into different areas over time like BRT.

Inter-City Commuter Bus and Train

There has been a revival of sorts in commuter rail and intercity transit service across the United States due largely to the suburbanization of metropolitan areas and resulting longer commute times and increased congestion on roadways. Ideas such as commuter rail and commuter bus have gained more prominence in recent years. With the growth of both Lincoln and Omaha and their connection along Interstate 80, such intercity transit ideas have gained popularity in Nebraska as well.

In December 2003, the Nebraska Transit Corridors Study was released by the Nebraska Transit and Rail Advisory Council (NTRAC). NTRAC was created by the State Legislature in 1999 to assess the transportation demand and needs of current and future commuters between the major cities of Nebraska. A major portion of this study dealt with commuter bus and commuter rail needs between the cities of Lincoln and Omaha. The feasibility of such services was considered as well.

Commuter trains were studied as an option to operate bi-directionally between Lincoln and Omaha during morning and evening peak commuter periods. There would be no weekend service. However, trains could serve special events, primarily University of Nebraska Cornhusker football events in the fall. Rolling stock would consist of self-propelled rail cars. Total capital cost for the track improvements, station improvements, and rolling stock totaled $79.3 million. Operating subsidies could range from $3.9 million to $4.2 million in year 2010.



Express bus services between the two cities was also studied. Buses would run bi-directionally between Lincoln and Omaha during morning and evening peak commuter periods. There would be no weekend service. Rolling stock would consist of suburban commuter buses which have more comfortable seating compared to urban transit buses. Total capital costs for new park-n-ride facilities and buses and other amenities totaled $3 million. Operating subsidies could range from $198,000 to $270,000 in year 2010.

The findings of the study were that commuter rail's high cost per new rider (ridership estimates were provided for each option) is higher than what federal agencies such as the Federal Transit Administration consider as eligible for federal funding. Thus it is unlikely that federal funds would be available for commuter rail under current conditions. Given the high capital cost of such a project, the lack of federal funding opportunities precludes the viability of this option at the present time.

The study also found that the commuter bus alternative has more attractive costs per new rider and may be eligible for federal funds. However, the bus option would need a local source for

covering operating subsidies, something that does not exist today. Overall, commuter bus appears to be easier and more practical to implement than commuter rail. Because of this, implementation of commuter bus services between Lincoln and Omaha is the most feasible near term opportunity of the options reviewed.

Personal Rapid Transit

An alternative to conventional transit and mobility paradigms is the application of personal rapid transit (PRT) technology and systems for transportation services. PRT is a network of small, lightweight transit vehicles on raised rails. The small vehicle design offers two advantages: the light weight of each vehicle allows for economic construction of the guide-ways and cars, while the personal size allows each transit rider to have his or her own ride. PRT acts as an individual demand responsive transportation service that is typically on elevated one-way guide-ways connecting small stations spaced relatively close together. With the stations placed off of the main guide-way, vehicles are able to by-pass the stations thus providing a non-stop trip. Current PRT designs envision small vehicles, or pods, seating 3-6 passengers and traveling at 25 to 50 mph.

The technical viability of PRT systems has been debated for decades. PRT technology was originally conceived in the 1950's and the technology continues to be refined today. While much of the material and expertise is available today to build a PRT system, only limited applications of the technology have been attempted.

This concept is, however, being studied today as a possible mobility option and application. A study was recently conducted by the Department of Civil Engineering at Kansas State University with funding from the Kansas Department of Transportation to look at how the implementation of a PRT system on the K-State campus would affect the mobility practices of those visiting and attending the University. The study did not look at the technical viability of such a system. Instead, it assumed that technical application was feasible and that a PRT system was in place on the campus. The study showed that the linking of remote parking with PRT technology to central campus activity centers improved the accessibility of the campus compared to current mobility systems such as the use of shuttle buses.

Personal rapid transit as a concept could be used as a dramatic shift in how personal transportation is provided in communities. Instead of constructing and maintaining roadways and depending on the personal automobile, or bus and rail transit, for most personal transportation needs, the use of PRT technology could potentially replace most if not all current mobility systems in the urban environment. This would be a "thinking out of the box" transportation application. The basic premise is that PRT can offer the public a transit system that meets the individual's mobility needs as well as cars do.

Activity Time Line and Responsibility

Each of the four long range transit options identified in this report should be monitored to ensure up to date information on these transportation applications is obtained. Also, changes in the local Lincoln/Lancaster community over time may change the applicability and viability of some of these options. Developments in technology and cost, combined with growth of the local community may over time create a condition within which one or more of these transit options becomes viable.

This is considered a long-term monitoring effort and implementation of any of these ideas is considered long range in nature. One exception to this is the possible nearer term implementation of commuter bus service between Lincoln and Omaha. Staff from the Planning Department, Public Works and Utilities Department, and StarTran should be involved in this activity with periodic discussions and updates taking place as appropriate.

Activity Purpose and Overview

Existing city staff will be able to conduct the ongoing research for this activity. No additional resources are needed at this time.